Office Action Summary	Application No.	Applicant(s)	
	10/699,242	NALAWADI ET AL.	
	Examiner	Art Unit	
	JIANYE WU	2462	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 December 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,5,8,9,11-15,17,20-23,25 and 27-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5,8-9,11-15,17,20-23,25 and 27-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments/Amendments

1. Applicant's arguments filed 12/19/09 have been fully considered, but not persuasive. Claims 1-2, 5, 8-9, 11-15, 17, 20-23, 25, 27-39 are pending. All Independent claims (1, 5, 13, 17, 22, 25 and 28) have been amended.

2. Applicant's arguments on independent claims 1, 5, 17, 22, 25 and 28 are moot because they have been significantly amended. Please see new ground rejections to the amended claims in the following.

3. Regarding 35 U.S.C. 101 rejections, amending Specification by deleting the term "carrier waves" does not completely cure the problem since the amendment does not definitely exclude the transitory medium. It is recommended to amend claim language to resolve this problem.

4. Regarding 35 U.S.C. 101 rejections, newly added limitations introduce new problems related to 35 U.S.C. 112. Please see the detailed description in the following.

5. Regarding 35 U.S.C. 103 rejections,

For claim 1, Applicant argues:

a) "Chan and Kim fail to teach or enable apportioning at least apportion of the total memory bandwidth amongst the plurality of bandwidth requests according to a power managed profile … wherein apportioning includes dividing the total memory bandwidth into a plurality of portions of the total memory bandwidth and satisfying at least two of the plurality of bandwidth requests each with at least one of the plurality of portions of the total memory bandwidth by combining data of at least two isochronous data packet transmissions of digital video data or digital audio data into a combined data packet transmission, wherein the combined data packet is a single databurst transmission during a single time of data of the at

least two isochronous data packets appended at their endpoints, wherein obtaining a plurality of bandwidth requests includes polling a plurality of isochronous applications corresponding to the plurality of isochronous devices, as required by claim 1" (last paragraph of page 13 to 1st paragraph of page 14);

b) "Applicants assert that IDE-bus extension 129 of Chan is not enabled to teach the above noted limitations of claim 1, and respectfully request the Patent Office provide a reference to support the position that either extension 129 or bus 128 can combine data of at least two isochronous data packet transmissions into a combined data packet transmission, as required by claim 1" (1st paragraph of page 15);

c) "polling a plurality of isochronous applications corresponding to the plurality of isochronous devices, as required by claim 1, embodiments described in the specification, without limitation thereto, provide the unexpected benefits of: (1) achieving a balance between total power available and the minimum bandwidth requirements of individual entities using at least four bandwidth portions (see paragraph 14 and FIG. 2 of the application; and claims 28 and 37); (2) achieving apportioning of the bandwidth dependent on selections and policies, such as those related to power usage by a processor, RAM memory, hard drive, processor logic, memory controller, chip set logic, and data bus use (see paragraph 23 of the application); and (3) apportioning based on an influence of interrupt driven asynchronous activity and having a goal of minimizing power consumption (see claim 1 and paragraph 24 of the application). However, none of the cited references teach or enable such unexpected benefits" (2nd paragraph of page 15);

d) "Finally, Chan does not teach, enable or consider a power managed profile based at least on interlock driven asynchronous activity and isochronous data communication, where the profile causes the bandwidth to be apportioned amongst the request, as required by claim 1" (2nd paragraph of page 17);

In response, Examiner respectfully disagrees:

a) Chan clearly discloses the limitation "apportioning at least apportion of the total memory bandwidth amongst the plurality of bandwidth requests" in FIG. 1. FIG. 1 shows the total bandwidth (at the bus to CPU & RAM 120) is divided into a plurality of portions for different devices (each device has a portion of the bandwidth) for drive 114 (which may include multiple storage devices) and CD-RAM/DVD drive 138 (which may also include multiple physical devices);

b) IDE-bus is the old standard interface used in normal PC, which supports 4 drivers that can be any combination of hard disks, CD-ROM/DVD drivers, floppy disks and the like. A Google search with "PC IDE four device" yields many references, one of them with title "Which is better - IDE, SCSI, USB or FireWire?" recites "**In a PC**, there are two interface channels built into the motherboard—one is called the Primary IDE interface and the other the Secondary IDE interface. This means there can be no more than four IDE devices connected at a time in a typical PC (Primary Master, Primary Slave, Secondary Master and Secondary Slave)". Note that IDE is an old technology widely available 199x. Running an isochronous (such as an audio/video) application on each of four devices will yields 4 isochronous data streams that would all merge into the main bus such as the bus to CPU & RAM 120 shown in FIG. 1 of Chan.

c) Polling is a popular technique that is widely used in Computer Operating system. When applying it to the four devices of the IDE interface disclosed above, all 3 listed benefits are expected, not unexpected.

d) First, the cited "interlock" in the argument does not exist in claim language and is assumed to be a typo and is being interpreted as "interrupt". The combination of Chan

and Uehara is used to disclose the cited limitation, not Chan along. Particularly, Uehara discloses using polling and asynchronous interrupt driven techniques to access isochronous devices based the power managed profile ("means for supplying an **interrupt** signal to the CPU … means for setting an operation mode of the power supply controller to one of a **polling mode and an event mode** in accordance with a mode setting request from the CPU or a result of detection of a predetermined power supply status, means for setting a power supply status concerning power control of the computer system in the register in response to a status read request supplied via the register from the CPU in polling mode, and means for monitoring various power supply statuses concerning **power management** of the computer system and setting data indicating any power supply status, whose change is detected, in the register upon detection of the change in event mode", col. 7, line 2-28).

For claim 2, Applicant argues:

a) "the cited references do not make obvious a data transmission policy to manage delaying transmission of a first isochronous data transmission and to manage combining data of the first isochronous data packet transmission with data of the second data packet transmission into a combined data packet transmission, as required by claim 2" (last paragraph of page 17) and

b) "a description of unknown amounts of delay or power drain caused by transmission gates of an IC does not teach or make obvious managing delaying transmission of an isochronous data packet transmission" (last paragraph of page 17 to 1st paragraph of page 18).

In response, Examiner respectfully disagrees:

a) Chan in view of Uehara clearly discloses a data transmission policy to manage delaying transmission of a isochronous data transmission, such as polling or

asynchronous interrupt driven techniques, as disclosed in the parent claim. Chan in view of Uehara clearly discloses combining data of the first isochronous data transmission and to combine data of the first isochronous data packet transmission with data of a second data transmission in, such as in FIG.1 of Chan, as explained in parent claim 1 and cited in the Office Action. I

b) Once again, polling or interrupt driven techniques are methods to manage delay of transmission. For example, a polling technique ensures that every device gets an opportunity for data transmission with a delay within a given max polling time, while interrupt driven techniques provides more efficient way to handle data transmission in reducing the delay time.

6. Applicant's arguments for other independent claims 5, 13, 17, 22, 25 and 28 (page 18-24) are similar to those of independent claim 1, therefore, Examiner's answer are the same.

Interview

7. A telephone interview was conducted on 3/11/10. Examiner asked the problem of insufficient antecedent for "the combined data packet" in claim 1. Examiner pointed out that Applicant's response on 12/19/09 appeared to acknowledge that the limitation of "combined data packet" is not disclosed in the Specification, but the limitation still exist in some of independent claims, such as claims 1 and 22. Applicant acknowledged there were problems in claim language. Applicant also asked a few questions regarding how Examiner interprets the claim language in view of cited prior art. Examiner explained to

Applicant his position on how the prior art cited in the previous Office Action were used to interpret the claim language.

Claim Rejections - 35 USC § 101

8. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9. Claims 22 and 25 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 22 and **25** recite "An article of manufacture comprising a machine-readable medium", which is defined in Specification as "A computer program product may be a medium configured to store or transport computer readable code, or a medium in which computer readable code may be embedded. **Some examples** of computer program products are CD-ROM disks, ROM cards, floppy disks, magnetic tapes, computer hard drives, servers on a network, and flash memory" ([0020]). Even though Applicant amended Specification by deleting "carrier wave" from the examples above, it does not exclude "carrier wave" and the likes from the machine-readable medium.

Examiner recommends amending "a machine-readable medium" to --a **non-transitory** machine-readable medium--.

Rejections - 35 USC § 112

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. **Claims 1-2,5,8,9,11-15,17,20-23,25 and 28-39** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Independent **claim 1** recites the limitation "wherein the combined data packet" lines 14. There is insufficient antecedent basis for this limitation in the claim.

Independent **claims 5, 13, 17, 25** has the same problem by reciting the limitation "wherein the combined data packet". There is insufficient antecedent basis for this limitation in the claims.

Claims 2, 31-34 and 37-38 are rejected because they depend from claim 1.

Claims 8-9, 11-12 and 35 are rejected because they depend from claim 5.

Claims 14-15 are rejected because they depend from claim 13.

Claims 20-21 are rejected because they depend from claim 17.

Claim 27 is rejected because it depends from claim 25.

Independent **claim 28** recites the limitation "wherein the combined data transmission is a single databurst transmission during a single time of data of the first isochronous data packets appended at its endpoints to an endpoint of the second isochronous data transmission". This limitation needs clarity, Particularly, it is unclear what is meant by "during a single time of data of the first isochronous data packets appended at its endpoints to an endpoint of the second isochronous data transmission".

The claim also recites the limitation "into *a combined data for* transmission" (last line). It is unclear if it is meant by "into a combined data transmission" or "into combined data for transmission".

Claims 29-30 and 39 are rejected because they depend from claim 28.

For examination on the merits, the claims will be interpreted as the best understood.

12. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

13. **Claims 22-23** and **36** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Independent **Claim 22** recites the limitation "combining data of at least two isochronous data packet transmissions into **a combined data packet** for transmission, the combined data packet is a single data burst transmission during a single time of data of the at least two isochronous data packets appended at the endpoints of the data by combining data of at least two isochronous data packets appended at endpoints of the data". There is insufficient support in the specification for this limitation in the claim, particularly, “a combined data packet” is not defined in Specification. Note that the “combined data packet” is not the same as the “combined transmission”.

Claims 23 and 36 are rejected because they depend from claim 22.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. **Claim 1-2, 13-15, 22-23, 28-30, 32, 34** and **36-39** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chan et al. (US 20020052990 A1, hereinafter Chan) in view of Uehara et al. (US 5,754,798, hereinafter Uehara).

For **Claim 1,** Chan discloses a method comprising:

obtaining a total memory bandwidth available for a time period (CPU 120 running the operating system such as Windows operating system on “Portable computers”, [0005] and [0006], which has total control over the memory and is able to obtain a total or part of memory bandwidth any time);

obtaining a plurality of digital video data or digital audio data (suggested by "third party audio application can play back standard audio CDs on a portable computer”, [0006]) bandwidth requests for the time period for a plurality of isochronous devices (“read-write mass storage drive 114” which can be “hard drives, floppy drives, optical drives and the like”, [0037] and CD-ROM drive 138 of FIG. 1; they are isochronous devices because video/audio data to/from them are isochronous);

apportioning at least a portion of the total memory bandwidth amongst the plurality of bandwidth requests (CPU 120 by running the Operating system has total control over bandwidth allocation as shown in FIG. 1, it manages bandwidth requests from different devices, such as drive 114 and 138) according to a power managed

profile (“Power management Routines (PMRs)”, [0041], where RMRs are power managed profiles; and “Under appropriate operating conditions, the PMRs may place the computer 100 into one of the several power management operating modes”, [0041]) and a plurality of data rate requirements (data requirements for audio applications as suggested by "third party audio application can play back standard audio CDs on a portable computer”, [0006]) associated with the plurality of isochronous devices (data requests associated with drives such as 114 and 138, FIG. 1, which are isochronous devices when audio applications are running on them); wherein the power managed profile causes the bandwidth to be apportioned amongst the requests (CPU 120 by running the Operating system has total control over bandwidth allocation as shown in FIG. 1, it manages bandwidth requests from different devices, such as drive 114 and 138), wherein apportioning includes dividing the total memory bandwidth into a plurality of portions of the total memory bandwidth (as shown in FIG. 1, total bandwidth is divided into a plurality of portions for different devices, such as drive 114 and 138) and satisfying at least two of the plurality of bandwidth requests (such as two requests associated with drive 114 and 138) each with at least one of the plurality of portions of the total memory bandwidth (CPU 120 by running the Operating system apportioning memory bandwidth into a plurality of portions to meet the requests associated with drives, such as drives 114 and 138 to ensure data arrive on desired destinations as shown in FIG. 1 in view of [0037]) by combining data of at least two isochronous data packet transmissions of digital video data or digital audio data (suggested by "third party audio application can play back standard audio CDs on a portable computer”, [0006];

note the two or more audio/video application can be played back from CD driver 138 or storage device 114 which is hard disk and the likes as shown in FIG. 1) into a combined data packet transmission, wherein the combined data packet transmission is a single data burst transmission during a single time of data of the at least two isochronous data packets appended at the endpoints of the data (FIG. 1 shows data packet transmission from isochronous devices 114 and 138 must be combined together to into CPU 120 for processing. In order to properly playback the two or more "third party audio application" or video on isochronous devices 114 and 138 must reach CPU 120 within a specified period of time, which is considered as the data burst transmission), wherein obtaining a plurality of bandwidth requests for isochronous applications corresponding to the isochronous devices (bandwidth requests for "third party audio application" on isochronous devices 114 and 138 obtained by CPU 120, as shown in FIG. 1); and

storing the data packet in a memory (the data packet needs to be stored in a memory either RAM 120 or storage devices like 114 and 138 before it is sent out, as shown in FIG. 1).

Chan does not explicitly disclose combining multiple data streams into a combined stream and using polling and asynchronous interrupt driven techniques to access isochronous devices based the power managed profile.

Chan is silent on using polling and asynchronous interrupt driven techniques to access isochronous devices based the power managed profile.

Uehara discloses using polling and asynchronous interrupt driven techniques to access isochronous devices based the power managed profile ("means for supplying an

interrupt signal to the CPU … means for setting an operation mode of the power supply controller to one of a **polling mode and an event mode** in accordance with a mode setting request from the CPU or a result of detection of a predetermined power supply status, means for setting a power supply status concerning power control of the computer system in the register in response to a status read request supplied via the register from the CPU in polling mode, and means for monitoring various power supply statuses concerning **power management** of the computer system and setting data indicating any power supply status, whose change is detected, in the register upon detection of the change in event mode", col. 7, line 2-28). Polling and Interrupt driven are commonly used techniques by the computer Operating System.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine Chan with Uehara to use the polling and interrupt driven techniques in order to save power assumption.

For **Claim 13,** Chan discloses a device comprising:

a bandwidth manager (the operating system of "Portable computers", [0005] and [0006], running on CPU 120 of FIG. 1, which has total control over the memory and is able to obtain a total or part of memory bandwidth any time) configured to apportion at least a portion of a total memory bandwidth available for a time period, amongst a plurality of bandwidth requests for the time period for a plurality of isochronous devices ("read-write mass storage drive 114" which can be "hard drives, floppy drives, optical drives and the like", [0037] and CD-ROM drive 138 of FIG. 1; they are isochronous devices because video/audio data to/from them are isochronous), according to a power

managed profile (“Power management Routines (PMRs)”, [0041], where RMRs are power managed profiles; and “Under appropriate operating conditions, the PMRs may place the computer 100 into one of the several power management operating modes”, [0041]) and a plurality of data rate requirements associated with the plurality of isochronous devices (data requirements for audio applications associated with drives such as 114 and 138, FIG. 1 as suggested by "third party audio application can play back standard audio CDs on a portable computer”, [0006]); wherein the power managed profile causes the bandwidth to be apportioned (bandwidth for each device is allocated according to PMRs [0041]) amongst the requests for asynchronous activity (such as data generated from key board 112 of FIG. 1) and isochronous data communication (audio application data associated with drive 114 and 138 of FIG. 1); wherein apportioning includes dividing the total memory bandwidth into a plurality of portions of the total memory bandwidth (as shown in FIG. 1, total bandwidth is divided into a plurality of portions for different devices, such as drive 114 and 138) and satisfying at least two (such as bandwidth requests associated with drives such as 114 and 138, keyboard 112 and etc., FIG. 1) of the a plurality of bandwidth requests (bandwidth requests associated with difference devices, as shown in FIG. 1) each with at least one of the plurality of portions of the total memory bandwidth (CPU 120 by running the Operating system has total control over bandwidth allocation as shown in FIG. 1, it manages bandwidth requests from the different devices) by combining data of at least two isochronous data packet transmissions into a combined data packet transmission (FIG. 1 shows data packet transmission from isochronous devices 114 and 138 must be

combined together to into CPU 120 for processing), wherein the combined data packet is a single data burst transmission during a single time of data of the at least two isochronous data packets appended at the endpoints of the data (Any portion of combined data packet transmission but be delivered to CPU 120 within a specified period of time, which is considered as the data burst transmission during a single time, the combined data packets for transmission are appended to the endpoint of the previous packet in traffic stream), wherein the plurality of isochronous devices are related to the plurality of isochronous applications run by a processor, and where the data rate requirement are associated with a plurality of time delay compliance limits for the plurality of isochronous devices ("The Windows operating system's media player or third party audio application can play back standard audio CDs on a portable computer", [0006] in view of FIG. 1 shows isochronous applications on hard drive 114 or CD-ROM Drive 138; the audio applications has time delay compliance limits requirements);

Chan is silent on using polling and asynchronous interrupt driven techniques to access isochronous devices based the power managed profile.

Uehara discloses using polling and asynchronous interrupt driven techniques to access isochronous devices based the power managed profile ("means for supplying an **interrupt** signal to the CPU … means for setting an operation mode of the power supply controller to one of a **polling mode and an event mode** in accordance with a mode setting request from the CPU or a result of detection of a predetermined power supply status, means for setting a power supply status concerning power control of the computer system in the register in response to a status read request supplied via the

register from the CPU in polling mode, and means for monitoring various power supply statuses concerning **power management** of the computer system and setting data indicating any power supply status, whose change is detected, in the register upon detection of the change in event mode", col. 7, line 2-28). Polling and Interrupt driven are commonly used techniques by the computer Operating System.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine Chan with Uehara to use the polling and interrupt driven techniques in order to save power assumption.

For **Claim 22**, Chan discloses an article of manufacture (Storage Device 114 of FIG. 1) comprising:

a machine-readable medium (Storage Device 114 of FIG. 1) having data therein which when accessed by a processor (CPU 120 of FIG. 1) causes a bandwidth manager to obtain a total memory bandwidth available for a time period (the operating system of "Portable computers", [0005] and [0006] running on CPU 120 of FIG. 1, which has total control over the memory and is able to obtain a total or part of memory bandwidth any time), obtain a plurality of bandwidth requests for the time period for a plurality of isochronous devices ("read-write mass storage drive 114" which can be "hard drives, floppy drives, optical drives and the like", [0037] and CD-ROM drive 138 of FIG. 1; they are isochronous devices because video/audio data to/from them are isochronous), and apportion the at least a portion of a total memory bandwidth amongst the plurality of bandwidth requests (CPU 120 of FIG. 1 or memory controller 122 of FIG. 1, which has total control over the memory, including apportioning memory bandwidth)

according to a power managed profile (“Power management Routines (PMRs)”, [0041], where RMRs are power managed profiles; and “Under appropriate operating conditions, the PMRs may place the computer 100 into one of the several power management operating modes”, [0041]) and a plurality of data rate requirements (data requirements for audio applications as suggested by "third party audio application can play back standard audio CDs on a portable computer”, [0006]) associated with the plurality of isochronous devices (data requests associated with drives such as 114 and 138, FIG. 1) by combining data of at least two isochronous data packet transmissions into a combined data packet for transmission (suggested by "third party audio application can play back standard audio CDs on a portable computer”, [0006]; note the two or more audio/video application can be played back from CD driver 138 or storage device 114 which is hard disk and the likes as shown in FIG. 1), the combined data packet is a single data burst transmission during a single time of data of the at least two isochronous data packets appended at the endpoints of the data by combining data of at least two isochronous data packets appended at endpoints of the data (FIG. 1 shows data packet transmission from isochronous devices 114 and 138 must be combined together to into CPU 120 for processing. In order to properly playback the two or more “third party audio application” or video on isochronous devices 114 and 138 must reach CPU 120 within a specified period of time, which is considered as the data burst transmission). wherein the power managed profile causes the bandwidth to be apportioned amongst the requests (CPU 120 by running the Operating system has total control over bandwidth allocation as shown in FIG. 1, it manages bandwidth requests

from different devices, such as drive 114 and 138), wherein obtaining a plurality of bandwidth requests (CPU 120 of FIG. 1 controls 122 or 124 of FIG. 1 in generating requests) includes a plurality of isochronous applications corresponding to the plurality of isochronous devices (e.g., software programs playing various audio and video streams from IDE devices, lines 11 of [0076], poll the IDE devices).

Chan is silent on using polling and asynchronous interrupt driven techniques to access isochronous devices based the power managed profile.

Uehara discloses using polling and asynchronous interrupt driven techniques to access isochronous devices based the power managed profile ("means for supplying an **interrupt** signal to the CPU … means for setting an operation mode of the power supply controller to one of a **polling mode and an event mode** in accordance with a mode setting request from the CPU or a result of detection of a predetermined power supply status, means for setting a power supply status concerning power control of the computer system in the register in response to a status read request supplied via the register from the CPU in polling mode, and means for monitoring various power supply statuses concerning **power management** of the computer system and setting data indicating any power supply status, whose change is detected, in the register upon detection of the change in event mode", col. 7, line 2-28). Polling and Interrupt driven are commonly used techniques by the computer Operating System.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine Chan with Uehara to use the polling and interrupt driven techniques in order to save power assumption.

For **Claim 28**, Chan discloses a system comprising:

a bandwidth manager to obtain a total memory bandwidth available from a memory for a time period (the operating system of "Portable computers", [0005] and [0006] running on CPU 120 of FIG. 1, which has total control over the memory and is able to obtain a total or part of memory bandwidth any time), obtain a plurality of bandwidth requests for the time period for a plurality of isochronous devices ("read-write mass storage drive 114" which can be "hard drives, floppy drives, optical drives and the like", [0037] and CD-ROM drive 138 of FIG. 1; they are isochronous devices because video/audio data to/from them are isochronous), and apportion at least a portion of a total memory bandwidth amongst a plurality of bandwidth requests for the time period according to a power managed profile ("Power management Routines (PMRs)", [0041], where RMRs are power managed profiles; and "Under appropriate operating conditions, the PMRs may place the computer 100 into one of the several power management operating modes", [0041]), wherein apportioning includes dividing the total memory bandwidth into at least four portions (see FIG. 1 in view of [0037], the total bandwidth may be divided to at least 4 portions, streams associated with 128, 118, 116 and 114s) of the total memory bandwidth to balance between total power available according to the power managed profile and a plurality of minimum bandwidth requirements of individual entities generating the plurality of bandwidth requests (CPU 120 by running the Operating system controls the memory bandwidth following "Power management Routines (PMRs)", [0041]);

a data transmission manager (the Operating system running on CPU 120 of FIG. 1) to delay transmission of a first isochronous data transmission having media data to be transmitted to or from a first of the isochronous devices (data streams from drives such as 114 and 138 merge into a combined data streams in bus 116 as shown in FIG. 1, which may cause delay), according to a data transmission policy ("Power management Routines (PMRs)", [0041]), wherein the combined data transmission is a single databurst transmission during a single time of data of the first isochronous data packets appended at its endpoints to an endpoint of the second isochronous data transmission (FIG. 1 shows data packet transmission from isochronous devices 114 and 138 must be combined together to into CPU 120 for processing. In order to properly playback the two or more "third party audio application" or video on isochronous devices 114 and 138 must reach CPU 120 within a specified period of time, which is considered as the data burst transmission during a single time), a data bus coupled between the memory and the plurality of isochronous devices (data bus 116 of FIG. 1 in view of [0038] coupled between the memory 120 and the plurality of isochronous devices 114 and 138), wherein the data transmission is read from or written to the memory via the data bus (FIG. 1 shows data transmission is read from or written to the memory via the data bus), wherein the combined data transmission is read from or written to the memory via the data bus, wherein apportioning includes dividing the total memory bandwidth into a plurality of portion of total memory bandwidth and satisfying at least two of the plurality of bandwidth request each with at least one of the plurality of portions of the total memory bandwidth by combining data of at least two isochronous

data packet transmissions into a combined data for transmission (an isochronous data stream, such as audio, from 114 of FIG. 1 and another isochronous data stream, such as video, from 138 of FIG. 1, are combined into one data stream in data bus 116 of FIG. 1).

Chan is silent on using polling and asynchronous interrupt driven techniques to access isochronous devices based the power managed profile.

Uehara discloses using polling and asynchronous interrupt driven techniques to access isochronous devices based the power managed profile ("means for supplying an **interrupt** signal to the CPU … means for setting an operation mode of the power supply controller to one of a **polling mode and an event mode** in accordance with a mode setting request from the CPU or a result of detection of a predetermined power supply status, means for setting a power supply status concerning power control of the computer system in the register in response to a status read request supplied via the register from the CPU in polling mode, and means for monitoring various power supply statuses concerning **power management** of the computer system and setting data indicating any power supply status, whose change is detected, in the register upon detection of the change in event mode", col. 7, line 2-28). Polling and Interrupt driven are commonly used techniques by the computer Operating System.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine Chan with Uehara to use the polling and interrupt driven techniques in order to save power assumption.

As to **Claim 2** and **23**, Chan in view of Uehara discloses claim 1 and 22, Chan further discloses the method comprising:

determining a data transmission policy (such as polling policy or one of the policies based on interrupt driven as disclosed in the parent claims) based on the power managed profile (PMRs, line 4 of [0041]) and the plurality of bandwidth requests (122 or 124 of FIG. 1, each device has bandwidth requests), the data transmission policy to manage delaying (see “may cause a delay”, [0080]) transmission of a first isochronous data transmission and to combine data of the first isochronous data packet transmission with data of a second data transmission (as disclosed in claim 1 and 22).

For **Claim 14**, Chan in view of Uehara discloses the device of claim 13, Chan further discloses the bandwidth manager is coupled to the plurality of isochronous devices to manage data communication between the plurality of isochronous devices and a memory (RAM, 120 of FIG. 1, is coupled with the plurality of isochronous devices such as Storage drives 114 and CD-ROM drive 138).

As to **Claim 15**, Chan in view of Uehara discloses the device of claim 14, Chan further discloses a duration of the time period depends on a status of a processor (CPU & RAM 120 of FIG. 1, where CPU running the Operating system manages control devices 122 and 124).

As to **Claim 29**, Chan in view of Uehara discloses the system of claim 28; Chan further discloses the data transmission policy further comprising: identifies a plurality of transmission time periods (suggested by “the CPU must periodically monitor peripheral devices", [0021]) during which to transmit a plurality of combined isochronous data

transmissions (the audio applications running on device 114 and 138, as explained in claim 28), and selects a time to transmit the combined data transmission between one of a transmission time of an asynchronous data transmission (data from keyboard 122), a third isochronous data transmission (another audio application on another device of 114 since it may have multiple devices as disclosed in [0037]), and a transmission time of one of the plurality of combined isochronous data transmissions (CPU 120 by running the Operating system selects a time to transmit the data).

As to **Claim 30**, Chan in view of Uehara discloses the system of claim 29, Chan further discloses transmitting an opportunistic data (such as the data from keyboard 112, FIG. 1) transmission prior to expiration of a transmission time period, the opportunistic data transmission having media data from at least two isochronous data packet transmissions of digital video data or digital audio into a combined data packet transmission (suggested by "third party audio application can play back standard audio CDs on a portable computer", [0006]; note the two or more audio/video application can be played back from CD driver 138 or storage device 114 which is hard disk and the likes as shown in FIG. 1), wherein the combined data packet is a single data burst transmission during a single time of data of the at least two isochronous data packets appended at endpoints of the data (CPU 120 by running the Operating system has total control of transmission as shown in FIG. 1, it can control the transmission according to user requirements, including the case of transmission prior to expiration of a transmission time period).

As to **Claim 32**, Chan in view of Uehara discloses the method of claim 1, Chan further discloses the power managed profile is based on power usage policy ("Power management Routines (PMRs)", [0041]) related to a processor, RAM memory (CPU & RAM 120 of FIG. 1), hard drive (Storage device 114 of FIG. 1), processor logic, memory controller (122 of FIG. 1), chipset logic and data bus use (124 of FIG. 1) (Note that .

As to **claim 34**, Chan in view of Uehara discloses claim 2, Chan further discloses the data transmission policy (policy implemented by controller 124 of FIG. 1) to manage delaying transmission of a third and a fourth isochronous data packet transmission (two more audio applications on devices of 114 since it may have multiple devices as disclosed in [0037]), and to manage combining data of the third and fourth isochronous data packet transmissions with data of an asynchronous data packet transmission (asynchronous and isochronous data packet transmissions are all merged via controller 124 to system bus 116 as shown in FIG. 1, where asynchronous data transmissions are delay to ensure isochronous packet data transmissions to be delivered in synchronization; notice that data are most commonly transmitted in packets in a digital system) into the combined data packet for transmission (as disclosed in the parent claim 1 and 2).

As to **Claim 36,** Chan in view of Uehara discloses claim 23, further discloses the method comprising: data to cause bandwidth manager to delay ("may cause a delay", [0080]) transmission of a third and of a fourth isochronous data transmission (two more audio applications on devices of 114 since it may have multiple devices as disclosed in [0037]), and combine data of the third and fourth isochronous data transmissions with

an asynchronous data packet transmission into the combined data transmission (as explained in parent claim above).

As to **Claim 37**, Chan in view of Uehara discloses the method of claim 1, Chan further discloses the portioning includes dividing the total memory bandwidth into at least four portions of the total memory bandwidth to balance between total power available according to the power managed profile and a plurality of minimum bandwidth requirements of individual entities generating the plurality of bandwidth requests (FIG. 1 shows portioning the total memory bandwidth into multiple portions with each portion for a specific drives, such as drives associated with Storage device 114 that may include multiple drives [0037], or IDE bus 128 [0039], which may have at least 4 drive (most PC IDE interface support 4 devices; CPU 120 by running the Operating system does the portioning to balance between total power available according to the power managed profile and a plurality of minimum bandwidth requirements of individual entities).

As to **Claim 38**, Chan in view of Uehara discloses claim 37, Chan further discloses that after storing (as disclosed in the parent claim above in claim 1), powering-up components required to transmit the combined data packet (system components always need to power up in order to transmit data packets, as shown in the system shown in FIG. 1); then transmitting the stored combined data packet (data are transmitted as shown in FIG. 1, such as on data bus between device 114 and CPU 120).

As to **Claim 39**, Chan in view of Uehara discloses claim 28, wherein the combined data transmission is a concatenation of a first frame of data appended to a

second frame of data (for data transmission, a concatenation is one frame appended by another by definition).

16. **Claims 5, 8-9, 11-12, 17, 20-21, 25, 27** and **35** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chan.

For **Claim 5**, Chan discloses a method and an article of manufacture tom implement the method, comprising:

delaying transmission (suggested by "cause a delay", [0080]; CPU 120 running Operating system has total controls data traffic of the system it will delay a data transmission if needed) of a first isochronous data transmission having media data of digital video data or digital audio data to be transmitted to or from a first isochronous device (an audio or video data stream from one of devices associate with storage device 114 of FIG. 1 in view of [0037]);

appending the first isochronous data transmission with a second isochronous data transmission having media data of digital video data or digital audio data to be transmitted to or from the first isochronous device into a combined data packet transmission (an audio data stream from CD-ROM drive 138, merging/appending with the data stream from device 114 into CPU 120 as shown in FIG. 1), wherein appending is performed according to a data transmission policy (CPU 120 follows "Power management Routines (PMRs) … Under appropriate operating conditions, the PMRs may place the computer 100 into one of the several power management operating modes", [0041], including controlling data packet transmission, as data transmission policy in view of [0041]), selecting a time to transmit the combined data transmission

(CPU 120 by running the Operating system selects a time to transmit the data), the combined data packet is a single databurst transmission during a single time of data of the first isochronous data packets appended at the endpoints of the data by combining data of at least two isochronous data transmission appended at its endpoints to an endpoint of the second isochronous data transmission (FIG. 1 shows data packet transmission from isochronous devices 114 and 138 must be combined together to into CPU 120 for processing. In order to properly playback the two or more “third party audio application” or video on isochronous devices 114 and 138 must reach CPU 120 within a specified period of time, which is considered as the data burst transmission), wherein selecting includes selecting between a transmission time of an opportunistic data transmission (such as data from keyboard 112 of FIG. 1) and a transmission time (the operating system of “Portable computers”, [0005] and [0006] running on CPU 120 of FIG. 1, which has total control over the memory and is able to transmit the specific data at a selected time) of a isochronous data transmission ("third party audio application can play back standard audio CDs on a portable computer”, [0006] running at device such as CD-ROM 138);

identifying a plurality of transmission time periods during which to transmit a plurality of isochronous data packet transmissions (multiple audio applications running at multiples devices such as devices associated with 114 and 138 of FIG. 1 with isochronous data streams being transmitted specified periods of time controlled by CPU 120, as shown in FIG. 1); and

selecting a time to transmit the combined data transmission (the operating system of “Portable computers”, [0005] and [0006] running on CPU 120 of FIG. 1, which has total control over the memory and is able to transmit the specific data at a selected time), wherein selecting includes selecting between a transmission time of an opportunistic data transmission and a transmission time of a combined isochronous data transmission (FIG. 1, where both opportunistic data [such as data from the keyboard 112] and the isochronous data above need to be sent, therefore selecting a time to transmit what type of data is made); performed according to a data packet transmission policy (“Power management Routines (PMRs)”, [0041], where RMRs are power managed profiles; and “Under appropriate operating conditions, the PMRs may place the computer 100 into one of the several power management operating modes”, [0041], including controlling data packet transmission);

storing the data packet in a memory (a data packet needs to be stored in a memory either RAM 120 or storage devices like 114 and 138 before it is sent out, as shown in FIG. 1).

Chan does not specifically disclose using a transmission policy to identify and selecting the transmission time periods.

However, Chan disclose a “Portable computers”, ([0005] and [0006]) running on CPU 120 of FIG. 1, whose operating system has the transmission policy to identify and selecting the transmission time periods for data transmission.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention that Chan disclose every limitation of the claim.

For **Claim 17** and **25**, Chan discloses a device (CPU 120 by running the Operating system controls the whole system, [0005]) and an article of manufacture, comprising:

a data transmission manager configured to delay transmission of a first isochronous data transmission having media data to be transmitted to or from a first isochronous device (such as "third party audio application", [0006], on device 114 of FIG. 1), and to append the first isochronous data transmission with a second isochronous data transmission (such as "third party audio application", [0006], on device 138 of FIG. 1) having media data to be transmitted to or from the first isochronous device (FIG. 1 shows data streams from devices merge to CPU 120), wherein the combined data packet transmission is a single databurst transmission during a single time of data of the first isochronous data packets appended at the endpoints of the data by combining data of at least two isochronous data transmission appended at its endpoints to an endpoint of the second isochronous data transmission (FIG. 1 shows data packet transmission from isochronous devices 114 and 138 must be combined together to into CPU 120 for processing. In order to properly playback the two or more "third party audio application" or video on isochronous devices 114 and 138 must reach CPU 120 within a specified period of time, which is considered as the data burst transmission), wherein appending is performed according to a data transmission policy ("Power management Routines (PMRs)", [0041], where RMRs comprise a data transmission policy); and

selecting a time to transmit the combined data transmission (OS has total control over the memory and is able to obtain a total or part of memory bandwidth any time), wherein selecting includes selecting between a transmission time of an opportunistic data transmission (such as data from the keyboard 112 of FIG. 1) and a transmission time of a combined isochronous data transmission (transmission time of a video/audio data stream from device 114 or 138, such as “third party audio application”, [0006]), wherein the data transmission policy identifies a plurality of transmission time periods during which to transmit a plurality of combined isochronous data transmissions (“play back standard audio CDs”, [0006], audio data are isochronous), and selects a time (“have several power down modes”, [0007]) to transmit the combined data transmission between one of a transmission time of an asynchronous data transmission (“have several power down modes”, [0007], which decides the transmission time), a third isochronous data transmission (e.g., another audio application), and a transmission time of one of the plurality of data transmissions wherein the third isochronous data transmission is to be transmitted to or from a second isochronous device (CD-ROM 138 of FIG. 1).

Chan does not specifically disclose using a transmission policy to identify and selecting the transmission time periods.

However, Chan disclose a “Portable computers”, ([0005] and [0006]) running on CPU 120 of FIG. 1, whose operating system has the transmission policy to identify and selecting the transmission time periods for data transmission.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention that Chan disclose every limitation of the claims.

As to **Claim 8**, Chan discloses the method of claim 5, Chan further discloses the opportunistic data transmission comprising one of an asynchronous data transmission (such as data from keyboard 112 of FIG. 1) and a third isochronous data packet transmission (such as another audio application on CD-ROM drive 138, FIG. 1).

As to **Claim 9**, Chan in combination disclose the method of claim 5, Chan further discloses the method comprising: the data packet transmission policy reduces a first frequency of transmission times related to transmitting the first isochronous data packet transmission to a less frequent second frequency of transmission times related to transmitting the combined data packet transmission (the frequency of transmitting the first isochronous data may be reduced within the boundary of time requirement for the isochronous data by definition of isochronous data packet transmission, as suggested by FIG. 1 since they share the same bus).

As to **Claim 11**, Chan in combination disclose the method of claim 5, Chan further discloses delaying (“cause a delay”, [0080]) transmission of the second isochronous data packet transmission (CPU 120 by running the Operating system has full control of data transmission of the system, it may cause a delay on any data stream, including the second isochronous data packet transmission).

As to **Claim 12**, Chan disclose the method of claim 5;

Chan further disclose the method comprising: transmitting the combined data packet transmission prior to expiration of a time delay compliance limit (suggested by

“cause a delay", [0080]; and CPU 120 has total control of the system and decides the time it desired to transmit a data packet).

As to **Claim 20**, Chan discloses the device of claim 17, further comprising: one of a processor (CPU 120 of FIG. 1) and a (data bus 116 of FIG. 1) coupled to a memory (RAM 120 of FIG. 1), wherein the combined data transmission is read from or written to the memory via the processor or the data bus (FIG. 1 shows data transmission is read from or written to the memory via the CPU 120 or the data bus 116).

As to **Claim 21**, Chan discloses the device of claim 17, wherein the media data of the first and second isochronous data transmission include one of digital audio data and digital video data ("third party audio application can play back standard audio CDs on a portable computer”, [0006]).

As to **Claim 27**, Chan discloses the method of claim 25, Chan further discloses data to cause the data transmission manager to transmit an opportunistic data transmission (such as data from keyboard 112 of FIG. 1) prior to expiration of a transmission time period (CPU 120 has total control of transmission time as shown in FIG. 1 in view of the combination of (“cause a delay”, [0080] and “Power Management Routines (PMRs)”, [0041]) the opportunistic data transmission having media data from at least two isochronous data packet transmissions (such as a “third party audio application”, [0006] , from storage device 114 and another from CD-ROM drive 138, FIG. 1).

As to **Claim 35**, Chan discloses claim 5 wherein appending further comprises: appending an asynchronous data packet transmission (such as data from keyboard 112

of FIG. 1) with the first and second isochronous data packet transmissions (such as "third party audio application", [0006] from CD-ROM drive 138) to form the combined data packet transmission into the combined data packet for transmission (the combing multiple data transmissions into one is explained in parent claim in claim 5 above).

17. **Claim 31** is rejected under 35 U.S.C. 103(a) as being unpatentable over Chan in view of Uehara, further in view of Hsu (US 6,288,896 B1, hereinafter **Hsu**).

As to **Claim 31**, Chan in view of Uehara discloses the method of claim 1, but are silent on the power managed profile is based on maximizing the life of a battery of a computer.

In the same field of endeavor, Hsu teaches maximizing the life of a battery of a computer (col. 1, line 28-30, "battery-powered computers, where maximum battery life is desirable").

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Chan in view of Uehara's teaching to setup power managed profile based on maximizing the life of a battery of a computer as taught by Hsu in order to requirements of users.

18. **Claim 33** is rejected under 35 U.S.C. 103(a) as being unpatentable over Chan in view of Uehara, further in view of Wu et al. (US 20030206520 A1, hereinafter **Wu**)

As to **Claim 33**, Chan in view of Uehara disclose the method of claim 1, Chan does not explicitly discloses the power managed profile apportions the bandwidth based on a balance between a total power available and a minimum bandwidth requirement of individual entities submitting the requests and including the isochronous devices.

Wu teaches balancing between power and bandwidth requirement ("optimal and flexible balance between radio bandwidth, terminal storage and power usage", [0047]).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Chan in view of Uehara's teaching to setup power managed profile based on optimal and flexible balance between radio bandwidth and power as taught by Wu in order to requirements of users.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jianye Wu whose telephone number is (571)270-1665. The examiner can normally be reached on Monday to Thursday, 8am to 7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on (571)272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jianye Wu/
Examiner, Art Unit 2462

/Donald L Mills/
Primary Examiner, Art Unit 2462